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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/881,825	06/18/2001	Noriyuki Miyamoto	209822US2S	7751
22850	7590	10/03/2003	EXAMINER	
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.			DONG, DALEI	
1940 DUKE STREET			ART UNIT	
ALEXANDRIA, VA 22314			PAPER NUMBER	

2875

DATE MAILED: 10/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/881,825

Applicant(s)

MIYAMOTO ET AL.

Examiner

Dalei Dong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/881,825.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,162,695 to Shimona in view of U.S. Patent No. 6,031,326 to Suzuki and in further view of U.S. Patent No. 6,455,995 to Jang.

Regarding to claims 1-5, Shimona discloses "the electron beams passing through the side apertures are converged on the screen. Both of these techniques have been adopted extensively in color cathode ray tubes. The deflection unit includes a horizontal deflection coil for generating a horizontal deflection magnetic field to deflect the electron beams in a horizontal direction and a vertical deflection coil for generating a vertical reflection magnetic field to deflect the electron beams in a vertical direction. In the color cathode ray tubes, when the electron beams are deflected, the deflection force causes the three electron beams not to be converged correctly. For this reason, self-convergence magnetic fields are formed, in which the horizontal deflection magnetic field is a pincushioning type and the vertical deflection magnetic field is a barrel type. Also, a convergent free system has been adopted in which the three electron beams can be

converged over the whole area of the phosphor screen" (column 1, line 55-68 to column 2, line 1-4).

Shimona also discloses in Figures 4 and 5, "electron gun assembly 100 disposed in neck 5 comprises cathodes K, first grid G1, second grid G2, third grid G3, fourth grid G4, fifth grid G5, sixth grid G6, seventh grid G7, insulating support member BG for supporting these grids and valve spacer 112. Electron gun 100 is fixed to stem pins 113 of the rear portion of the neck. Cathodes K each have a heater inside and generate three electron beams BR, BG and BB. The first and second grids G1 and G2 each have three relatively small beam-passing apertures corresponding to three cathodes K. These apertures serve to control and accelerate the electron beams generated by cathodes K. These cathodes K, the first and the second grids G1 and G2 constitute the so-called electron beam generating section GE. The third, fourth and fifth grids G3, G4 and G5 each have three relatively large beam-passing apertures corresponding to three cathodes K.

As shown in FIG. 4, four electrodes 20, 21, 22 and 23, extending perpendicularly to the direction of in-line arrangement (X-Z plane), are arranged in the in-line arrangement direction to hold therein three beam-passing apertures 52R, 52G and 52B on that side of the fifth grid G5 which faces the sixth grid G6. Referring to FIG. 5, the sixth grid G6 has two electrodes 24 and 25 extending in parallel with the in-line arrangement direction and has two electrodes 24 and 25 fixed on the side facing the fifth grid G5. Three beam-passing apertures 61R, 61G and 61B are formed in the side of the sixth grid G6 between the electrodes 24 and 25. FIG. 4 shows that the four electrodes 20, 21, 22

and 23 fixed on the fifth grid G5 are arranged between electrodes 24 and 25 of the sixth grid G6. When voltage is applied across the fifth grid G5 and the sixth grid G6, quadrupoles are formed between the four electrode plates of fifth grid G5 and the two electrode plates of the sixth grid G6.

The sixth grid G6, which is a generally cup-shaped electrode, has formed on the side facing the fifth grid G5 three beam-passing apertures 61R, 61G and 61B generally identical in size with beam-passing apertures 52R, 52G and 52B of the fifth grid G5. The sixth grid G6 has formed on the side facing the seventh grid G7 a single large round aperture 62 to pass the beams therethrough. In this cup-shaped electrode and at the mid-point in the longitudinal direction thereof, there is electrode 60 having a racetrack-like beam-passing aperture 63 with its major axis in the in-line arrangement direction (X direction) as shown in FIG. 6A. This beam-passing aperture 63 is placed at a specified distance "a" from the end of the side of the sixth grid G6 closer to the seventh grid G7. The distance "a" is smaller than the diameter D6 of large round aperture 62.

The seventh grid G7 is generally a cylindrical electrode, and a part of the cylindrical sixth grid G6 is received therein. A large-diameter cylindrical lens is formed between the seventh grid G7 and round aperture 62 of sixth grid G6. Electrode 70 is provided in the cylindrical electrode of the seventh grid G7, placed at a specified distance "b" from the end of the sixth grid G6 towards the screen. Electrode 70 has therein a racetrack-like beam-passing aperture 73 with its minor axis in the in-line arrangement direction (X direction) as shown in FIG. 6B. The relation of the specified distance "b" to the cylinder diameter D7 of the seventh grid G7 is $b < D7$. In this embodiment, the

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distances "a" and "b" are selected to satisfy an inequality, $a > b$ " (column 4, line 56-68 to column 5, line 1-52).

Shimona further discloses "as the voltages are applied to the electrodes as described, the electron beams produced by the cathodes K, in response to modulation signals, form crossover CO as shown in FIG. 8 due to the cathodes K, the first grid G1 and the second grid G2. Therefore, the electron beam diverged at this crossover CO is slightly focused by the prefocus lens PL formed by the second grid G2 and the third grid G3. Therefore, the electron beam is made to form a virtual crossover point VCO by the prefocus lens PL, and the lens QEL so that the electron beam is seen as if it is produced at the crossover VCO corresponding to the image point of the crossover CO, diverged and incident on the third grid G3. The beams BR, BG and BB incident on third grid G3 are focused towards screen 2 and are also converged towards a point on screen 2 by the main electron lens ML1 formed by the third grid G3 to the seventh grid G7. Thus, the side beams are deflected by the convergence as described towards the center beam and to a common convergence point near the screen" (column 6, line 16-35).

Shimona further yet discloses in Figure 11-12 "two electrode plates 53 and 54, which are located above and below the three beam-passing apertures 52R, 52G and 52B, are fixed to the end of the fifth grid G5. Likewise, two electrode plates 511 and 512, located above and below three beam-passing apertures 511R, 511G and 511B are fixed to the side of the additional grid G51 (at least one electrode) facing the fifth grid. Four electrode plates 513, 514, 515 and 516 are arranged in the upright position on the side of the additional grid G51 which faces the sixth grid G6. Likewise, four electrode plates

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612, 613, 614 and 615 are arranged in the upright position to hold three beam-passing apertures 61R, 61G and 61B therebetween on the side of the sixth grid G6 which faces the grid G51. In the sixth and seventh grids G6 and G7, noncircular beam-passing aperture 63 is provided to form a large-diameter cylindrical lens just as in the above-described embodiment.

When the fifth grid G5, the additional grid G51, the sixth grid G6 and the seventh grid G7 are formed, between the opposing electrode plates of the fifth grid G5 and the additional grid G51, which does not have focusing power in the horizontal direction but has a focusing power only in the vertical direction. And, a parallel plate lens FLV is formed, between the opposing electrode plates, the additional grid G51, and the sixth grid G6, which does not have focusing power in the vertical direction but has a focusing power only in the horizontal direction.

With the arrangement described, the electron beams are strongly focused by the lens FLV and the lens FLH. The electron beams from the beam generating section GE are focused strongly in the horizontal direction to be generally parallel and focused slightly in the vertical direction. The beams, still diverged, are incident on the common large-diameter asymmetric lens LEL and the three beams are focused and converged on the screen by the large-diameter lens as in the above-described embodiment" (column 9, line 52-68 to column 10, line 1-22).

However, Shimona does not disclose a separate velocity modulation coils from the deflection yoke and the projecting portion of an end face thereof, which is to be in physical contact with the second electrode member. Suzuki teaches in Figure 10, "the

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electron gun using the electrodes with the gap VM, such as illustrated in FIGS. 4, 5, 6 and 9, which are installed in the neck portion of a cathode ray tube. A velocity modulation coil 90 is disposed on the outside of the neck portion at a location corresponding to the gap VM. The velocity modulation coil 90 operates to improve the contrast by changing the scan velocity of the electron beam. Among the literature disclosing such a feature is Japanese Patent Publication No. 21216/1987" (column 15, lines 17-25).

Suzuki also teaches in Figure 10, "the focus electrode of the above embodiment is long in the tube axial direction. Hence, reducing its axial length by providing the gap VM can prevent a deformation of the electrode. The velocity modulation coil 90 disposed on the outer surface of the neck portion near the gap VM provides high contrast and therefore a high quality image. Aligning the center of the gap VM with the center of the velocity modulation coil 90 enables the electron beam to be efficiently subjected to the action of the velocity modulation coil 90" (column 15, lines 26-35).

However, Suzuki fails to teach the projecting portion of an end face thereof, which is to be in physical contact with the second electrode member. Jang teaches in Figures 3 and 4, "a cathode 31 emitting electrons when heated by a heater (not shown) and a plurality of electrodes G to focus and accelerate the emitted electrons. Specifically G1, G2, G3, G4, G5-1, G5-2 and G6 are a control electrode, screen electrode, first focus electrode, second focus electrode, third focus electrode, fourth focus electrode, and anode electrode, respectively. E_{c1} , E_{c2} , $V_f + V_d$ and E_b represent voltages, applied to the corresponding electrodes. However, the present invention differs from the prior art in

that there is provided a solid dielectric 32 (*first electrode member has a projecting portion which is to be in physical contact with the second electrode member*) between the second focus electrode G4 and the third focus electrode G5-1. As shown in FIG. 4, the solid dielectric 32 is preferably a thin rectangular plate with electron beam-passing holes 32a, 32b, 32c and protrusions 32t for secure coupling with the second electrode which, in turn, has small recesses where the protrusions are to be inserted” (column 2, lines 35-50).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilize the modulation coil of Suzuki and the electrode member of Jang for the electron gun of Shimona in order to improve the contrast by changing the scan velocity of the electron beam and maximize power efficiency of a voltage signal applied to a dynamic electrode of an electron gun.

Response to Arguments

3. Applicant's arguments with respect to claims 1-5 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following prior art are cited to further show the state of art of composition of an electron gun.

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U.S. Patent No. 4,701,678 to Blacker.

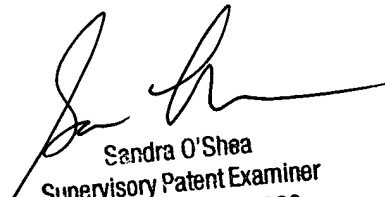
U.S. Patent No. 5,539,278 to Takahashi.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dalei Dong whose telephone number is (703)308-2870. The examiner can normally be reached on 8 A.M. to 5 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on (703)305-4939. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7722 for regular communications and (703)308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

D.D.
September 8, 2003



Sandra O'Shea
Supervisory Patent Examiner
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